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American Horticulture.

AMONG the records of permanent value which have been made by commissions who represented foreign governments at the Chicago International Exhibition of 1893 we have seen none more comprehensive and thorough than the report of Monsieur Maurice L. de Vilmorin, who was Secretary of the Committee on Horticulture from France. This makes a large and beautifully printed octavo volume of two hundred and thirty-odd pages, and while it gives a clear account of the French horticultural exhibit, together with a sketch of the horticultural material from other foreign countries, by far the larger portion of the work is taken up with a review of the present condition of horticulture in the United States. The house of which Monsieur de Vilmorin is a member has had for years large business relations with the horticulturists of this country; he had traveled extensively in this country before, and during the season of 1893 he made extensive journeys over various parts of our territory. These opportunities, a habit of trained observation and a familiarity with the subject in all its multiform phases give great authority to his statements and weight to his judgment in all matters discussed.

After a general introduction on the rapid growth of horticulture in the United States, Monsieur de Vilmorin writes at some length of fruit-culture in particular, its importance, its history and its tendencies, and he adds a careful review of the methods pursued in the temperate parts of our country with our various orchard and stone fruits, grapes and small fruits, besides an account of the cultivation of subtropical fruits in the warmer portions of the country. This is followed by a singularly clear description of our market-gardens and truck-farms with the methods of cultivation, transportation and marketing. In fact, we are not aware that so much accurate information on these subjects has ever before been collected, even for American readers, and we hope in future issues of this journal to treat more fully some of the topics suggested in this section.

The third part of the report, and one that will have special interest for readers of GARDEN AND FOREST, is devoted to ornamental horticulture and floriculture in the United States. Monsieur de Vilmorin notes the natural and historical causes which have impeded the development of the highest taste in garden-art among us. It is only in the longest-settled parts of the Union where there are any estates that have been handed down for some generations and have such a connection with the family history as to inspire strong local attachments. Even in these older states there is more movement of the population than in European countries, and, therefore, not such strong reasons for decorating home-grounds. A great portion of our large territory is still practically in the pioneer stage, and the population, engaged in mining and lumbering and other industrial work, have enough to do to build comfortable houses, without any attempt to adorn their surroundings; and even in the sections where there is a certain stability of population, the country is still new and lacks that mellowness which only comes to a land which has long been subdued and moulded to the wants and ways of men and women who have lived in it and loved it. Monsieur de Vilmorin remarks, too, that in the New England states and New York the rigor of our winters makes it impossible to grow numbers of garden-plants which are easily cultivated in southern France, for example. We do not count this as a serious drawback, however. We have plants enough, and usually try to grow too many. Besides this, there are many flowering shrubs and trees and herbs which are more beautiful here than they are in milder climates, and quite as interesting and attractive as the most showy products of the tropics. If our climate presents difficulties, they have helped, as is suggested in this report, to stimulate the zeal of amateurs in the cultivation of our own beautiful species of shrubs and trees, besides many others from Japan and China and the lofty mountains of India, until the variety which has been secured for outdoor planting leaves nothing to be desired.

The beauty of some gardens in New England and the middle states very plainly impressed Monsieur de Vilmorin, and he was somewhat surprised at many of those he visited in the southern states about Mobile and New Orleans, and at the flower-embowered houses of southern California, where the genial climate will soon make a paradise with a little aid, and where the natural flora, both herbaceous and woody, is one of almost unexampled richness. In these favored parts of our country, especially in the towns, the lavish floral garniture left in his memory impressions like those made by the great gardens of Cannes and Nice. What he was not prepared for, however, was the fact that, in less favored climates and in states which had been settled in comparatively recent years, cities like Minneapolis, Cleveland and Detroit, and the towns of British Columbia, had developed such activity and, in the main, such good taste in decorative gardening.

What particularly arrested the attention of Monsieur de Vilmorin in our northern cities, where the winters are so long and severe, is the generous support given to commercial floriculture. The abundance of cut flowers, especially of Roses and Orchids, and of Palms and other plants used for their form and foliage, is not only alluded to, but the report contains some account of the general method in which they are disposed in decorative work. The statistics of the wonderfully rapid growth of commercial floriculture are very carefully compiled from our Census and other sources, and special methods of cultivation are described. Then follows a sketch of American Rose-culture and the propagation of the plants, for forcing and for outdoor planting, and an estimate of the value of some of our best native shrubs and trees, like the Cornels, Rhododendrons, Kalmias, Andromedas, Sumachs, etc., together with the climbing plants and Grasses most generally used in our ornamental planting. After this we have an admirable section on cut flowers, including those raised in the open air and under glass, with the methods of cultivating each, and another section on the cultivation of plants for market. It may be said here that the production of so many varieties of the

Bouvardia, with flowers of singularly pure color and admirably adapted for cutting, is noted by Monsieur de Vilmorin as one of the happiest examples of American horticultural skill.

In concluding his review of ornamental horticulture in the United States, Monsieur de Vilmorin does not restrain his admiration at its wonderful development in so short a time. He was impressed, too, with the marked advance in garden-art which had taken place since his visit only sixteen years ago, and with the fact that it already fills such an important place in the daily lives of a young people. We are pleased to know that he found so much to approve in the skilled work of the various sections of the Department of Agriculture, and in the researches carried on at the experiment sations and some of the agricultural colleges, particularly those against fungi and insects, which he finds in their thorough and practical quality abreast of the best scientific investigation of the time. Among other educational influences which he enumerates as making the progress of horticulture in the country secure for the future, Monsieur de Vilmorin says, of the Arnold Arboretum, that it embraces the most complete collection of trees and shrubs which now exists in the world, and that every year adds to its richness and helps to place the establishment on a more elevated plane. We must pass with casual reference his appreciative notice of the landscape-gardening in our public parks and cemeteries and of some conspicuously good railroad planting like that which has been begun by the Boston and Albany Railroad in the vicinity of Boston; his approval of our various horticultural societies; his commendation of the work of Garden and Forest in its peculiar field, and his high estimate of the usefulness of the horticultural press in general. His summing up of the whole suggests some points in which the prosperity of American horticulture ought to be instructive to older countries, and in a future issue of this journal we hope to show that these observations furnish wholesome food for reflection to the people of the United States as well as to the people of France.

The alarm which has been excited by the invasion of the so-called Russian Thistle has had the good effect of making our farmers suspicious of every strange plant as a possible enemy. Indeed, many common weeds which have been before their eyes every summer, but which they have never observed and practically never seen, are now likely to throw them into a panic. For some years the Prickly Lettuce has been a common inhabitant of the northern part of Indian Territory, but Professor Arthur writes that although the plant has little real resemblance to the Russian Thistle its prickly leaves have raised that suspicion, and many specimens have been received at the Experiment Station of that state with the inquiry whether or no they were that dreaded pest. Even so far eastward as New Jersey the common St. Johnswort, Hypericum perforatum, is sent to the station with the inquiry whether or no it is not the Russian Thistle. It is worth noting that the specimen sent to the New Jersey station consisted of dilapidated and disguised portions of a plant with abundant seed-pods which was taken from a car-load of stable litter bought in New York by a truck farmer, and this instance shows how manure from the city stables can operate as a disseminator of noxious weeds. What we wish primarily to observe, however, is that this alarm over the Russian Thistle will serve some good purpose if it arouses farmers to a more careful study of the whole subject of weeds. Anything which impels them to gain new information as to the particular habits of these pests, and the best way of attacking and subduing them, will prove a substantial service to agriculture. In our short dry summers the loss of the water which is stolen from cultivated plants by weeds is often enough of itself to make a crop unprofitable.

An Appropriate Fence.

The picture we give on page 485 shows an excellent type of fence for the enclosure of grounds which do not need to be walled-in, and yet, being spacious and dignified, demand something more than a mere wooden paling or an iron one of an ordinary commercial kind. It was built by Messrs. McKim, Mead & White, whose beautiful gateways to the yard of Harvard University, in Cambridge, are similar in character, although, as befits their station, more stately and ornate. The piers are of brick, slightly varying in color and laid-up with wide mortar-joints, so that the monotonous mechanical effect of our customary brick-work is avoided. The cappings are of stone, and the iron-work is simple, yet relieved from baldness by the introduction of two slender ornamental motives between each pair of the piers. The general result is sober, quiet, unostentatious, and not too pronouncedly urban, yet, on the other hand, vigorous, durable, refined and dignified—not too distinctly rural.

The grounds thus protected are those of the Germantown Cricket Club, near Philadelphia. When cricket is not being played they are much used by lawn-tennis players; and the buildings, erected by the same architects who designed the fence, add conspicuously to their beauty as well as to the comfort of their frequenters. In addition to the main club-house, there is a smaller one for the use of ladies, and also a grand-stand, which, with its fine lines and proportions and slender classic colonnades, is equally entitled to be called a work of architectural art. We have heard it affirmed that these are the most beautiful cricket-grounds in the world; and whether this be strictly true or not, we can well believe that their grand-stand excels any other in dignity and grace.

The tree which overhangs the fence in the foreground of our picture is an old specimen of the Yellow-wood, or Virgilia (Cladrastis lutea). It is eccentric in shape and, therefore, not the best example which could be shown of this beautiful species. Nevertheless, it has a special claim upon our interest, for it is believed to be the oldest Virgilia in the United States that is known to have been planted by the hand of man.

Late Autumn in the Pines.

The foliage of trees is only one of their attractive features, and late autumn brings out others quite as interesting as the summer clothing. This is specially true of the Sweet Gum. As the handsome fragrant leaves loosen their hold they leave behind globular heads swaying on long slender pedicels, which are really ornamental, more ornamental, in fact, than useful, as nearly all of them are filled with a powdery dust and no seed whatever. And the corky, ridged branchlets are curious, too, and the dark gray trunk, so clean and healthy, is a delight to the eye. No insects seem to mar it. Can it be that the pleasant fragrance of the wood is distasteful to these pests? True, we occasionally see some of the more rare larvæ, like the queen of the night, the lovely Luna, feeding on the leaves, and the great larva of the fine imperial moth is sometimes seen here, too, as if the tree was too good for common insects, and only fit for royal ones.

Some of the Black Oaks are wonderfully attractive in late autumn, persistently holding their deep scarlet and dark crimson leaves until well into winter, and the dark rugged trunks are also handsome. Another interesting feature of the Black Oaks is that they are never destitute of fruit, as it takes two years for the acorns to mature. And this makes even our little Scrub Oak attractive in winter. But the Oak, almost more than any other tree, is the home of many noxious insects. More than two hundred known species are catalogued as preying upon them, some living on the leaves, others in the acorns, still others in the young branches, causing them to fall, so that every autumn the ground beneath the trees is almost covered with the twigs. This is the work of the larva of a little pruning beetle, but

it is not so disastrous to the tree as are the larvæ of some larger beetles which work in the bark of the trunk, and still others in the hard wood often tunneling their way to the centre of the tree. I have noticed this in logs which were split for fire-wood. The broad-necked Prionus laticollis is the parent of the largest of these larvæ, which, when full-grown, is about three inches in length and as thick as a man's thumb. A few years ago these beetles were very numerous in the Pines, and even the streets of our town were thronged with them, but something has greatly decreased their numbers of late years, while the larva of a large goat moth, probably Cossus centerensis, is on the increase. Many empty shells of the chrysalids may be seen sticking half-way out of holes made by the larvæ, both in the White and Black Oaks.

The Swamp Maple holds its deep crimson leaves very late in the season, more especially the younger trees, and their reddish twigs are always attractive. The Magnolia is nearly an evergreen here; young trees wholly so. The Persimmon, too, holds its foliage and fruit until very late, making an interesting feature among the Pines. The Cedars, in fruit, are highly ornamental when mingled with the Holly, with its scarlet berries, each enhancing the other's beauty, and many shrubs are at their best now with scarlet and crimson, and black and gray fruits. Even the poison Sumach looks tempting, with its drooping slender panicles of dun-colored fruit, which remains all winter. A well-grown shrub of Baccharis, with its abundant long, white, silky pappus, makes a pleasing feature of the Pines at this season, wherever it occurs.

The continued drought of summer had its effect on some of the plants and has caused them to flower a second time. When the autumn rains came, I noticed several shrubs of Andromeda Mariana blooming as profusely as in spring. Kalmia angustifolia bloomed also, and the Wild Rose took a fresh start, showing many flowers among its scarlet hips. The Swamp Loosestrife, Nesæa verticillata, is still blooming in sheltered places, and we find here and there Asters and Solidagos as bright as in early autumn. The Bur Marigold is also blooming, and the Cone-flower and our Pine Sunflower—Helianthus angustifolius—have not wholly ceased flowering. The Golden Aster, Chrysopsis Mariana, is quite full of bloom.

Rhexia Virginica shows here and there a flower among its pretty urn-shaped pods, and white and blue Violets greet us in moist places.

Many other plants, not in flower, are specially handsome now. Helonias, with its tuft of thick shining evergreen leaves, is much more beautiful here amid the Pines than it is in cultivation, and the great clump of grass-like curved leaves of Xerophyllum remind us of the old Roman definition of beauty, "multitude in unity." The Pitcher-plant has put on brilliant colors, showing charming tracings and veinings in the curious leaves. The Club Moss, Lycopodium dendroideum, like a tree in miniature, is abundant in damp places. The Prickly Pear, Opuntia vulgaris, is full of fruit, which is edible, but not tempting enough to induce one to risk the barbed bristles with which it is surrounded.

Vineland, N. J. *Mary Treat.*

The Wild Cherry in the West.

WILD BLACK CHERRY.—This species has not been planted to anything like the extent it would have been if its merits were appreciated. Aside from the fine quality of its timber, it succeeds under such widely varying conditions of locality that it should form a part of every prairie grove. At Farlington, Kansas, about six acres of the Kansas City, Fort Scott and Memphis Railroad Company's plantation were planted to a mixture of Wild Cherry, Black Walnut and Chestnut in 1878. Not only have the Cherry-trees grown well, but they equal in size the Catalpas planted at the same time, and are much better shade-making trees than the Catalpas, and therefore valuable nurse trees for the light-foliaged Black Walnuts. One of the tallest Wild Cherry-trees measured thirty-nine feet eight inches high, and was six and a half inches in diameter three feet from the ground. The Wild Black Cherry was found in good condition at Ogallah, in north-western Kansas, on high dry land, and trees at Brookings, South Dakota, are among the very best in the experiment forest-plats of the Agricultural College. At this place there are a number of half-acre plats in different mixture. The one composed of Wild Cherry, White Elm, Green Ash and White Birch, planted by single trees in the order named, four feet apart, and now seven years old, is the best plat in the plantation. The Ash and Elm are growing tall and straight, being forced up by their denser-foliaged neighbors. The Cherry-trees are only beginning to show strong leaders, having thus far been round-headed and full of branches; but, as seen in the Farlington plantation, as the trees grow older the laterals die off, one branch takes the lead, and the bole lengthens into a good straight shaft. An advantage of this free branching during youth is the ability to shade the ground, and thus prevent weed-growth.

The Wild Cherry is also one of the best growing trees in an irrigated nursery at Denver, Colorado, so that it proves itself useful over a wide area, and should be generally planted.

Washington. *Charles A. Keffer.*

Foreign Correspondence.

London Letter.

THE CHRYSANTHEMUM BREEDER.—A lecture on the crossing and raising of Chrysanthemums from seed was given this week at the meeting of the Royal Horticultural Society by Mr. Charles E. Shea, of Foots Cray, Kent, a well-known amateur breeder and grower of Chrysanthemums. Contrary to the general belief, Mr. Shea says the crossing of these plants and the ripening of their seeds are easy of accomplishment in England. We receive the bulk of our new seedlings from France, Italy, China, Japan and the United States. Mr. Shea stated that probably one hundred thousand new seedlings are raised and tried in America every year, and that some noted growers in England test ten thousand new seedlings annually. At this rate we are certain to metamorphose the garden Chrysanthemum before very long.

Mr. Shea showed that while it is generally believed that the Chrysanthemum will not ripen seeds in this country because of the unfavorable character of our winter weather, with a little contriving they can, as a matter of fact, be made to seed quite freely. He obtained a quarter of a pint of good seeds this year as the result of his operations, all conducted in a small greenhouse thirty feet by twelve feet. He recommends that the floor of the greenhouse should be of cement, backed in the middle, with a drain at each side, so that the water that runs from the soil in watering may get away easily. A dry atmosphere is of first importance. Air is admitted to the house at all times beneath the hot-water pipes, fresh air also being essential. All the sunlight possible is, of course, beneficial to the plants.

In choosing plants to operate upon, Mr. Shea prefers those which have been under ordinary treatment, as generous culture, such as is given when large flowers are aimed at, has the effect of weakening, and even destroying, the organs of fertilization. Medium-sized blooms, with what growers call an open eye—that is, a number of disk-florets exposed—are best, and such flowers are produced by even the sorts that are most double toward the end of the flowering period. The smaller the eye the better the flower is for breeding purposes. When the pollen appears on the disk the flower should be watched until all the anthers have burst. Chrysanthemums are, according to Mr. Shea, decidedly proterandrous—that is, the pollen is ready some time before the stigmas—so that it is scarcely likely that any flower (head) would be self-fertilized, although, of course, pollen might reach it from another flower on the same plant. The stigma is in a receptive

condition when its two lobes spread out. This can easily be seen with an ordinary pocket lens. The flower should then be dusted over with pollen, not once merely, but once or twice a day for several days. Every head thus treated will produce good seeds. Mr. Shea deprecates the shearing off of the ray-florets preparatory to fertilizing, although he says it is invariably practiced by American breeders. He recommends that the ray-florets should be removed with scissors as soon as they wither. The seeds mature and ripen quickly if the plants are placed near the warm pipes, and if the flowers operated upon hang over so as to almost touch the pipes, so much the better. When the seeds are ripe they should at once be removed from the receptacle. Mr. Shea's test for ripeness is pressing the florets with his fingers, and if they come away easily they may be gathered at once. The flowers nearest the centre of the disk invariably produce a large proportion of single-flowered seedlings, but flowers on the outside produce nearly all double-flowered progeny. Mr. Shea has found that seeds ripened on the extreme outside of the flower-head produce practically none but double-flowered sorts.

The best results, so far as time of flowering is concerned, are obtained by crossing early with late flowering sorts. Such a cross yields varieties which flower in the middle of the season, say the second week in November, and these find most favor with growers. The qualities to be aimed at depend upon various circumstances. Mr. Shea has always discarded tall-growing sorts, the most desirable height, in his opinion, being five feet or less. He also destroys varieties that have bad foliage. With regard to the size of the flowers, that, he said, was controlled by the exigencies of the exhibition tent. When two flowers of equal quality in all points except size were placed before a judge he had no alternative but to give the prize to the larger of the two. But there was no doubt that too many points were given for mere bulk of flower. Some of the largest-flowered among the newer sorts were coarse and ugly. Refinement of character—that is, elegance of form and pleasing colors—ought to be a sine qua non with raisers of new Chrysanthemums. In that direction much good work remained to be done. Mr. Shea concluded by urging English horticulturists to raise their own seedlings and to look out for the blue Chrysanthemum.

More New Chrysanthemums.—I trust I am not mistaken in believing that your readers are interested in learning what among the new varieties of Chrysanthemums are favorably received here. I assume this is so because a large proportion of our best new sorts are, I believe, of American origin. This week the number of certificated new varieties has been considerable. I would, however, first name a variety which has not yet won that distinction, but which will, in the opinion of competent judges, soon become a great favorite on account of the exceptional color of its large blooms. It is evident from its name, Madame C. Capitant, that it is of French origin, although it was exhibited by Mr. Godfrey, of Devon. It is a large, full, somewhat flat Japanese variety, with broad petals, and its color is a pale pink, exactly the color of a Malmaison Carnation. It is sure to be in great demand, especially with ladies.

Miss Maggie Blenkiron, the variety mentioned by me last week, was, I find, raised by Mr. C. E. Shea. It is a large incurved Japanese, almost a pure incurved, the flowers being conical, and the color rich yellow shaded with crimson. Dulcie Schrœter and Sir E. T. Smith, also from Mr. Shea, are two rich yellow, large-flowered varieties of the reflexed Japanese class. Mrs. W. J. Godefrey is one of the white, hairy-flowered section, and, although it obtained a certificate, I question if it is distinct from Mrs. A. Hardy. Another of the hairy-flowered section is Mrs. Ward, the flowers of which are very large and colored coppery red, tinged with crimson. J. Bidencope is a big-flowered Japanese variety of a bright magenta color. J. Lightfoot is also a large-flowered Japanese of a pale lilac color, the margins of the petals being of a deeper shade—a distinct and pleasing break. Garnet is a very large incurved Japanese, as regular almost as Lord Brook, the color a rich vinous purple, with a gray-purple reverse. Alice Seward is a similar variety, but colored crimson-purple, with a silvery reverse. I have a weakness for the single-flowered varieties, and I, therefore, gladly record three beautiful additions to this section in Purity, which has flowers of the purest white, four inches across, the bright yellow eye-like disk being an inch in diameter; Carrie Wells, a glorified ox-eye Daisy, with a deep yellow disk and spreading terra cotta red ray-florets; W. E. Renfrey has flowers four inches across and ray-florets of a rich glowing magenta color.

Mr. Cannell exhibited a new introduction from Japan, named Mrs. R. Filkins, which has medium-sized flat flowers with narrow petals, fringed at the apex and of a bright yellow color. It is described as forming a big bush which flowers as freely as Miss Rose. Some immense flowers of Hairy Wonder revealed the coarseness and ugliness of this variety when overfed. Another ugly variety of this class, which, however, succeeded in obtaining a certificate, is Princess Œna, a rose-purple sport from Hairy Wonder.

Grafted Chrysanthemums.—Two years ago a Belgian gardener exhibited some Chrysanthemums which he had grafted on C. frutescens, the Paris Daisy. They were remarkable for the strength of their stems and the substance and size of their flowers. In the January number of the *Revue de l'Horticulture Belge* for this year there is a figure of one of these grafted specimens when two years old, with an account of the treatment pursued by Monsieur Alex Callier, the grower of the specimen, which was a dwarf standard with a head nearly nine feet through, bearing seven hundred and ninety well-formed flowers, the variety being Val d'Andorre. The plant was grafted in January, and after flowering the following winter it was shaken out and repotted, first into a comparatively small pot, and then into larger pots, until finally it was planted in a tub a yard across. The advantages claimed for grafted Chrysanthemums over those on their own roots are that (1) large specimens are easily grown and the stems are kept perennial—there being, of course, no suckers; (2) the plants grow more vigorously and flower more profusely. At Kew there are now half a dozen of these grafted Chrysanthemums. They were grafted in January last on young stocks a few inches long, and they are now quite equal to the best of the plants on their own roots. The sorts tried are Maiden's Blush, Stanstead White, Val d'Andorre, Source d'Or and Golden Dragon. Raisers who wish to give vigor to seedlings which are weak on their own roots should try them on the Paris Daisy. It is possible that very large shrubby Chrysanthemums could be grown out-of-doors in many places if they were grafted on C. frutescens.

London. *W. Watson.*

Plant Notes.

The Ridgely Chestnut.

THE soil and climate of Delaware appear to be well adapted to the growth of the Chestnut. The trees are plentiful in all parts of the state, and many of them produce nuts of large size, which are of the finest quality. The largest and best chestnuts are those obtained from trees in the vicinity of Dover. This is, no doubt, due to the fact that upon the farm of Mr. D. M. Ridgely, about two miles west of Dover, there is a very large Chestnut-tree, known as the "Original Ridgely Chestnut-tree." This tree is said to have sprung from a sprouted imported Chestnut, which was presented to Mr. Ridgely by Mr. Dupont, and planted some sixty or more years ago upon the farm where it now stands. The nuts produced by this tree are known as Ridgely chestnuts, or Dupont chestnuts. Many seedlings have been grown from the nuts of this tree, but few of them bear nuts which, in both size and quality, equal the product of the original tree. Those of large size are generally of an inferior quality, while nearly all that are small are of excellent flavor.

I visited this tree last fall and found that it measured fourteen feet in circumference at three feet above the

ground, and is not less than seventy-five feet high, while the spread of its branches is nearly equal to its height. It rarely fails to produce a crop of nuts, and they sell readily in the markets for a high price.

The nuts are fully equal in both size and quality to the Paragon, of which so much is now said. One nurseryman at Wyoming, Delaware, showed me samples of chestnuts, a few days ago, which were produced from Ridgely seedlings of his own growing, that were fully equal to the Paragon nuts. The growing of the seedling trees is not very satisfactory, as they are usually slower to come into bearing than the grafted trees, and the nuts are very apt to be inferior to the seed planted. Seedlings may be grafted as readily as the Apple, and the grafts will often produce nuts the following year. The United States Pomologist refers to this Chestnut in his reports for the years 1889 and 1890. Chestnut-culture is each year receiving more attention in this state. The Ridgely has given the most satisfactory results of any variety in this section, and it deserves to be more extensively disseminated.

Experiment Station, Newark, Del. *M. H. Beckwith.*

Fig. 77.—Fence enclosing the grounds of the Germantown Cricket Club.—See page 482.

HYBRID TEA ROSE, DEAN HOLE.—Three years ago a hybrid Tea Rose, of unknown parentage, was brought into this country from France, and it has proved a very desirable Rose for forcing. This was Madame Caroline Testout. The flower is of an especially pleasing color, which light up beautifully, and is probably the clearest shade of pink known in the whole Rose family, and, altogether, it has an

air of refinement quite distinct and peculiar. The plant also grows well and blossoms freely out-of-doors. Last spring a sport from this Rose originated with Mr. John H. Taylor, a well-known Rose-grower of Bayside, New York. The habit of the new plant is good, it grows vigorously, has good dark green foliage, blooms continuously and bears its flowers on good stout stems. The color is a novelty in its class, being a creamy white, shading to a delicate pink in the centre of the flower. Indeed, the prevailing color may be said to be a very pale pink, resembling in shade the Daybreak Carnation, with the color deepening a trifle at the centre. If the new Rose resembles its parent in constitution it should prove hardy with very slight protection, and it is probably as good for cultivation in the open air as for forcing under glass. As we stated in a recent issue, a flower of this new Rose was exhibited in this city at a banquet in honor of Dean Hole, and it was named after the guest of the evening by Robert Craig, President of the National Rose Society. Perhaps it will lead to no confusion, but the fact ought to be generally known that there is another Rose, a hybrid Perpetual, which was sent out by G. Paul in 1872 under the name of S. Reynolds Hole. This is said to be a Rose of great beauty, maroon flushed with scarlet-crimson, full and well formed, but not adapted to general cultivation.

Begonia Socotrana.—When better known, and its demands for a long summer rest are understood, this is pretty sure to become a popular winter-blooming greenhouse plant, as it flowers in November and December, when free-blooming plants are most in demand and most difficult to have. No other Begonia remains longer in good condition or excels this species in the beauty of its large bright pink flowers and ample circular cup-like leaves. Begonia Socotrana is an herb with a thick, succulent, slightly branched stem six to ten inches high, orbicular peltate leaves, seven to ten inches in diameter and much depressed in the middle, and bright rosy pink flowers fully four inches across. It produces tubers freely at the base of the stem, by which the plant can be easily increased. When the leaves begin to wither in January or February the roots should be dried off and the tubers taken from the pots and kept in dry sand in a cool place until they begin to show signs of growing the following summer or autumn, when they should be potted and treated like other tuberous Begonias. A long period of absolute rest is all that is required to secure large foliage and abundant flowers. B. Socotrana was discovered by Professor Bailey Balfour on the hot and dry island of Socotra, off the coast of Arabia, in the Indian Ocean, and was introduced by him into European gardens in 1880. It has been freely used by hybridizers, and is an important element in some of the new winter-flowering hybrid Begonias, although none of them that we have seen equal it in habit, purity of color and profusion of flowers.

Cultural Department.

A New Method of Irrigation.

MUCH has been written of late years concerning the necessity of irrigation, and several experiments in what is known as subirrigation have been published. The laying of tiles sufficiently deep to be out of reach of the plow, and making them serve for drainage purposes in spring, or whenever there is an excess of water in the soil, and using them for purposes of irrigation by stopping the outlet in summer, has been to some extent satisfactorily practiced, but it is not applicable to all soils, and no perfect system has yet been devised. An interesting paper was read before the Association of Colleges and Experiment Stations, at their recent meeting, by Professor F. W. Rane, of the West Virginia University, which presented another method of irrigation which is original, and may prove of practical use in horticulture where the object is to get water to the roots of the plants, and use the water with as little waste as possible. Professor Rane's plan, as he described it, was the following:

Common porous two-and-a-half-inch drain-tiles were laid in a continuous row, end to end, on the surface of the soil, and vegetables were planted on either or both sides of the line. The tiles were one foot long, and by pouring in the water at one end of the line it was distributed at the joints throughout the length desired, when the opposite end was stopped up.

Take Celery as an example crop for irrigation on uplands. We plant the Celery as above stated, and while it is young we have simple surface irrigation; but as the crop grows we bank it up, and finally have the tile covered, and thus have subirrigation. The tiles are cheap and last indefinitely. When the Celery is harvested the tile is dug out also and piled up or used for subirrigation in the greenhouse-beds. Potatoes and various other crops can be grown in the same way. The Celery watered this year grew well, and did not rust. Besides this, we were able to water twenty times as much space in the same time as in the ordinary way with ditches. Besides saving time, this plan delivers the water where it is most needed, and we have reason to believe is fully as economical with water as with time.

Rows of Celery watered in this manner were planted in a Potato-field, leaving every other space between the Potato-rows vacant, so that two rows of Potatoes could be dug together when ripe. Besides watering the Celery, the moisture reached the tops of the Potato-hills, as was plainly seen every morning by the dampness of the surface throughout the intervening space, thus showing that the watering was sufficient for at least three feet and three inches on each side, or six feet six inches in all, the rows being three feet three inches apart. Where the rows were on a slight incline we slipped a piece of tin between the joints, and held the water where it was needed; then, by pulling it out and inserting it further down, another section could be treated. The sections can be made longer or shorter, according to the angle at which the ground inclines.

Indian Azaleas.

FLORISTS every year import Indian Azaleas by the thousand with their buds already set, and bring them into flower principally for the Easter trade. The plants are sold, but what becomes of them it is hard to tell. They rarely find a place among window-plants, unless, as already intimated, they have been bought from the florists evidently by people who do not know how or cannot find time to attend to their simple wants. It is a fact, notwithstanding, that few plants are easier to grow and take care of than these, and some acquaintances of mine have plants which continue to improve each year.

It is evident, from the condition in which imported plants arrive, that they are not grown in pots. They come with nearly square masses of earth, with no indications of being cramped as pot-grown plants are, and they are evidently either grown in the open where they can be protected in winter, or can be moved in for protection. This is an easier and more satisfactory plan than growing them continuously in pots, providing the natural soil is suited to them, as is the case in those parts of Europe where they are grown extensively. They like a deep peaty soil in which there is a substratum of sand, but they will thrive well, under artificial conditions, in common garden-soil moderately enriched with decayed leaves. There is to be found in one Massachusetts garden, at least, superbly grown specimens which have not been in the greenhouse for eighteen years. Some of these plants are between forty and fifty years old. They flower in June, at a season when they can be arranged in large numbers, in more or less natural fashion, in the open air, with merely a cover of canvas to protect the flowers from sun and rain. Their beauty can be more fully appreciated when seen in this way than in the confines of a greenhouse. They are stored in deep glass-covered pits, with the additional protection of shutters and leaves to keep out the frost. On my suggesting that by this method they were being retarded beyond their natural blooming season, which is toward the end of April and May, and that there could not be time enough to complete their growth and mature their buds, the gardener said they had never failed, adding "They have got used to it." This he ascribed to the plan of cultivation followed, which, although contrary to the old-time notions, has been very successful. Years ago these plants were grown in pots; they had been shifted from time to time until they filled pots of the largest size. It was found that these old solid balls of earth had not a live feeding root in the interior of the ball. Strong roots traversed the ball to the sides of the pots, where alone there was new soil, and there the feeders were.

Under these circumstances the best thing to do was to give top-dressing, for to reduce the ball meant breaking away what few feeders there were, and the consequent loss of a season before vigor returned. Planting out in the open ground finally had to be resorted to, and is now practiced every year.

When the blooming season is over, toward the end of June, the plants are overhauled as soon as possible, all dead and weak shoots and seed-vessels cleaned off, and the extra-strong shoots pruned in. In reducing the balls of earth preparatory to planting it will be found that very little soil adheres to the original ball, very few, if any, new roots having been formed through the winter, all the work of the plants having been done during the preceding summer. The potting is only a handy way of caring for the plants through the winter and for convenient handling when in bloom. In planting, the plants are placed a little deeper than they would be if potted. This encourages new roots on the surface above the original ball; as the gardener says, "It gives them new life." It will be noted that this ball of earth is very solid. This packing and pressing is done by the plant itself, and the hardened ball will be found to be a solid mass of fine roots. It is an important element of success that this ball be kept moist during the growing season. The soil must be made very firm about the ball, and a slight basin formed, so that water does not run in between the ball and the new soil. In connection with this it should be borne in mind that the Azalea grows on the mountainous regions of India, through China and in Japan, where there is a very heavy rainfall during the growing season, and so, under artificial conditions, they should be almost saturated with water during the months of July and August. In potting for the winter sandy soil should be used. It is easier worked in and about the ball, and comes off easily in spring. In winter all the light and air possible should be given. Very little water will be required if the plants are in good condition when put away.

Wellesley, Mass. *T. D. H.*

Rose Notes.

AS late as the 6th of November I saw, near Philadelphia, good flowers on unprotected plants of the La France Rose outdoors. This habit of continuing to flower until freezing weather is one of the good forms of this excellent Rose. During hot summer weather the outer petals sometimes burn, but the flowers are at their very best when the days become short and the nights cool. The flowers are then of the largest size, full and double, and delightfully fragrant. The so-called White La France, properly Augustine Guinoisseau, has also proved a good summer Rose, either for outdoor planting or under glass, but the title White La France is a misnomer, for the flowers are usually pinkish.

American Belle, the light-colored form of American Beauty, has found more favor as a cut flower in its home market of Philadelphia than elsewhere, though it certainly is a beautiful flower when well grown. Its growth, however, is sometimes disappointing, so that its parent is still in the lead as a commercial variety.

Rose sports have lately become quite numerous, and a majority of them seem to tend toward lighter colors than the parent, though notable deviations from this rule are found. Some years ago a bright red sport from La France appeared in the establishment of a commercial florist, but the sport lacked the free-flowering habit of the parent, and it was discarded after a season or two of trial.

Mrs. W. C. Whitney has so far proved a Rose of good constitution, and its deep pink flowers are produced with great freedom in winter. It is a useful summer Rose, too, although its color is then less attractive.

Kaiserin Augusta Victoria not only forces well, but it grows strongly out-of-doors, and bears large flowers. Belle Siebrecht and Mrs. Pierpont Morgan are the most promising of new American varieties, although it is never safe to predict the value of a Rose on a short trial. The past season has been a hard one for outdoor flowers, owing to the extreme heat, but where the Roses have been watered freely a fair succession of bloom has been kept up, though the flowers were in most instances smaller than they would have been in cooler weather. The largest flowers I have noticed outdoors this year were on a strong plant of Paul Neyron, and they would measure from five to six inches in extreme diameter. This is a good size, even for this variety, and it shows what can be done in the cramped area of a city front yard by careful management. Captain Christy, though it does not flower freely, is another variety which can be commended for outdoor culture, and when in good condition the flowers are of rare beauty.

Holmesburg, Pa. *W. H. Taplin.*

Protecting Strawberries.—This is about the proper time to scatter some protecting material over Strawberry-beds. We prefer to put it on when the ground is hard-frozen, and a wheelbarrow can then be run through the rows without disfiguring anything. We have found no better cover than dry leaves scattered evenly over the whole quarter. Some corn-stalks or pea-brush, laid thinly over them, will prevent the wind from blowing them about. Many growers make a great mistake in heavily mulching the beds with rotten, or half-rotted, manure. We have often seen this covering taken off early in the spring, and the blanched, sickly appearance of the plants was evidence enough of the folly of giving such winter protection. Plants protected by leaves never fail to show up green and fresh when uncovered, and we rarely lose a plant by this treatment.

Taunton, Mass. *W. N. Craig.*

Correspondence.

Planting White Pine.

To the Editor of GARDEN AND FOREST:

Sir,—Some of the farmers near my country house in Andover, Maine, are discussing the expediency of planting trees on the wild lands and pastures from which White Pine was cut many years ago. Where can they find rules for such forest-planting—simple, clear rules—giving the distances between the trees and rows; stating whether it is better to plant seed or transplant young trees; whether the trees for transplanting should be one year old, or two years old, or older yet, besides such other information as they require? All these lands could be covered again with forests if the proper method was only pursued, and I should be obliged for any suggestions.

Boston, Mass. *H. W. Suter.*

[The results obtained by planting the seeds of the White Pine in the open ground where the trees are to grow permanently have usually been unsatisfactory. Shade and moisture seem to be required to insure a good crop of seedlings, which, moreover, are very delicate and suffer at first from full exposure. The only practical way to cover a piece of ground with White Pines, where none are springing up naturally from seed scattered from trees in the neighborhood, is to plant seedlings obtained from the woods or raised in nurseries. Plants from three to five years old and six to ten inches high are best for this purpose. If the ground is much broken and very stony, the plants should be set two to four feet apart between the rocks, wherever there is soil for them. If the surface of the ground, however, permits the use of a plow, shallow furrows four feet apart each way should be made and trees set at their intersection. The trees would grow faster during the first five years if the whole of the ground to be planted could be plowed before the furrows were laid off and kept clear of grass and weeds until it was completely shaded. This, however, adds very considerably to the first cost of the plantation and is not necessary, unless a particularly rapid growth during the early years of the plantation is required. If the ground is not laid off in furrows, holes must be made for the trees with a spade; a piece of sod a foot across should be first cut out and the soil beneath it loosened to the depth of ten inches; in this loose soil the tree should be planted, and then the sod cut in two pieces to fit round the tree should be replaced, the upper side downward in the hole. The roots of the trees should be covered with mud to prevent them from drying up after they are unpacked and before they are planted. This is best done by dipping them into a tub of wet mud of the consistence of porridge. They should then be tied in bundles of convenient size. A man or boy carrying one of these bundles and walking ahead of the planter should drop a tree at each hole or at the intersection of the furrows; the planter following behind should take the tree, holding it in his left hand, spread out the roots with his right hand, draw the soil over them and press it down firm with his foot. The two important things in tree-planting is to spread out the roots that they may grow without becoming matted, and to make the soil about them hard and firm. There is no danger of making it too compact and hard. Good plants carefully set in this way ought to grow without any further

care and should cover the ground at the end of four or five years. A few years later it will probably be necessary to cut out the trees in every other row, although the character of the soil and the size of the plants must determine the period and extent of such thinnings. It is generally cheaper and more satisfactory to use nursery-grown plants than to obtain them from the woods, and, unless very large plantations are to be made during a series of years, when a home nursery should be established, it is best to buy plants from some reliable nurseryman. Seedling conifers are difficult to raise in this climate, owing to the heat and dryness of our summers, and none of them, perhaps, are more difficult to manage than the White Pine; and no one is successful with it unless he makes the raising of seedling conifers a business, and has had some experience in it. When a few trees to bear seed and restock the ground are left in cutting a forest of Pines, when fire is prevented from burning off the herbs and low shrubs, which make the best possible protection for seedling conifers, and the surface of the soil, and when cattle are excluded, the ground will soon be covered with Pines again, and the foundation of a new forest will have been laid in the cheapest and most satisfactory manner. A self-sown forest costs nothing but the employment of a little common sense and, perhaps, a little rough fencing. There is no interest account running against it, while the interest against a planted forest, which will cost, at the lowest estimate, from five dollars to ten dollars an acre to establish, must, at the end of even fifty years, be debited with an interest charge which will more than eat up all the possible direct money profits of the undertaking. —Ed.]

Extracting Cedar of Lebanon Seeds.

To the Editor of Garden and Forest:

Sir,—I notice what you say about demolishing Cedar of Lebanon cones in Garden and Forest of November 14th, and this reminds me that years ago when this beautiful conifer was in much greater demand at the nurseries than at the present time, we always imported the cones in order to secure fresh seed. To extract the seed we placed the cones singly in a vise, then, with a three-eighths of an inch augerbit, bored out the rhachis, or central woody part, after which the scales were easily pulled apart and the seeds separated from the scales. There are many species of our indigenous Pines that have very persistent cones, which will remain closed for years if gathered and stored in a dry place. Boring out the centre is a very simple and ready means of getting at the seed when it is wanted. This habit of remaining closed is a wise provision of nature for preserving the seeds, and as long as they remain hermetically sealed up in the cone they lose little or nothing in the way of vitality, and I have myself opened Cedar of Lebanon cones twenty years after gathering them, and found the seed fresh and sound. There are also instances on record of seeds of the same sprouting freely after having remained in the cones for forty years.

Ridgefield, N. J. *A. S. Fuller.*

Chrysanthemums for Outdoor Culture.

To the Editor of Garden and Forest:

Sir,—I was greatly interested in an article in your issue of November 7th, from a New Jersey correspondent, on outdoor Chrysanthemums. I have had my trials in the same line, and at times nearly despaired, but I hope this year's experience has set me in the right direction. The Buffalo season may not be as long as that of Elizabeth, but it is greatly favored, as the lake assures us a very equable temperature. Tender plants are seldom killed here in October, and they were not seriously injured this year till the severe freezing of November 11th. This permits us to bloom all the earlier Chrysanthemums outside if we desire, and makes their cultivation possible to many who have no room for them indoors. Their season can be finished readily enough by potting them in full bloom and setting them in a window, but the average householder cannot successfully bloom them in the house.

For our purpose the strong, stocky, early sorts should be selected. I have tried in vain to raise the old purplish red Duchess in this way. It is hardy and vigorous, readily wintering out-of-doors, and it is a great bloomer, but it is late, and will grow about as high as a man's head, in spite of all pruning. Last spring I set out a single plant of Mrs. Whilldin, an early yellow sort. It produced, without assistance, a single stalk, which spread out like a tree, and grew into a veritable little tree about two feet high. When hard frosts threatened it was potted, and finished its season in a window. I am convinced that such easily handled sorts are to be had in all desirable shades by carefully selecting from the multitude of varieties. Such points as these are the ones about which amateurs need information. There are good plants to be had. Who is testing them for outdoor cultivation, and who will give us the results of their experience?

We are greatly pleased with the new silvery, purplish pink Chrysanthemum, Maud Dean, the finest, it seems to me, that has appeared lately. Florists have greatly overdone the yellow varieties to the expense of other colors.

Buffalo, N. Y. *John Chamberlin.*

The Walking Fern and its Haunts.

To the Editor of Garden and Forest:

Sir,—The curious and beautiful Camptosorus rhizophyllus is occasionally listed by florists. Perhaps I have failed to give it proper treatment, but I have always found it a most fastidious pot-plant, exacting conditions of shade, drainage and ventilation that none but those with unusual facilities could give it. It has been very capricious with me even with outdoor transplanting, refusing to live except when planted in the shadiest nook of the rockery, and even there producing but a feeble, protesting sort of growth, with short yellowish green fronds, while the curious and characteristic attenuation of the frond's tip, that tapers to a thread only to fall to the earth and spring up a new Camptosorus, is much curtailed, and in some instances lacking. In its native haunts, however, the plant shows not a trace of weakness. There it is fairly riotous with life and vigor, embroidering the moss-carpeted rocks with feathery tufts of slender, procumbent and spreading fronds of the richest, deepest green, each tuft linked to its neighbor by the slender chain-like acumination that binds each of the little colony together. It is very plentiful here, but I have never seen it growing in any other situation than at the foot of a precipice or rocky bluff, usually attached to the moss that covers rocks, or else growing between the crevices of limestone rocks. The soil is always of a highly calcareous nature, and the shade dense. Here, with a home to its liking, it faces alike heat, cold, drought or flood, ever luxuriant and green. I know of one such rocky valley where these Walking Ferns grow with singular luxuriance and reach the largest size. In the preparation of a road-bed for a railroad every vestige of tree or underbrush was removed, but the piled up rocks were left undisturbed. Three years afterward the once beautiful Camptosorus had dwindled to a few pale yellowish specimens of stunted growth. This would seem to show that we can only succeed in transferring this lovely evergreen wilding to our homes by giving it deep shade and a limestone anchorage for its roots.

Pineville, Mo. *Lora S. La Mance.*

Recent Publications.

Text-book of the Diseases of Trees. By Professor Robert Hartig. Translated by Willliam Somerville. Macmillan & Co., London and New York. Pp. 331, 8vo, fig. 159.

The leading laboratory of the world for the study of the diseases of trees is that of Professor Robert Hartig at Munich, and no other botanist has made in this field so many investigations in which scientific study has been united with practical suggestions. The first edition of his *Lehrbuch der Baumkrankheiten* appeared in 1882, and was the first work on the subject which gave a clear and satisfactory presentation of modern investigations. The excellent translation by Professor Somerville, revised and edited by Professor Marshall Ward, follows a later edition of the *Lehrbuch*, which includes considerable matter not found in the original work. In the preface to the English edition Professor Marshall Ward traces in an interesting manner the development of plant pathology in its relation to forest-trees, and especially the contributions of Hartig to our knowledge of the subject.

While the *Lehrbuch* was highly valued as an authoritative treatise by experts in foreign countries as well as in Germany, the English translation brings within the easy comprehension of a large circle of readers a most interesting account of the fungous parasites which attack forest-

trees, the action of unfavorable conditions of soil and air upon them, and, incidentally, an account of the anatomy and physiology of the healthy tree. After an excellent introduction on the causes of disease which are classified as due to parasitic Phanerogams and Cryptogams, to wounds and to unfavorable conditions of the soil and air, the writer passes to an account of plants like Mistletoe and Dodder, which, although not strictly parasites, sometimes do considerable injury to trees. The greater part of the book is devoted to descriptions of the special parasites belonging to the different orders of fungi and their action. This part of the book is of necessity somewhat technical, and to follow all the details implies a previous acquaintance with the structure and classification of fungi, but the numerous figures make it possible for the reader who does not possess this knowledge to obtain a large amount of valuable information which would be beyond his reach in more elaborate mycological treatises. Especially important are the chapters relating to the large fungi, like Trametes radiciperda and several species of Polyporus, which cause rotting of timber, as well as those on Agaricus melleus and the dry-rot fungus, Merulius lacrymans. An American is struck by the large number of species known by careful investigation to cause disease in Germany, while, in our less developed scientific condition, the same fungi are passed by as harmless in this country. It may possibly be the case that, owing to large tracts of forest still being in a condition of nature, certain fungi, which prove to be decidedly injurious in the more artificial conditions of forest-culture in Europe, are here really comparatively innocuous. Polyporus Schweinitzii is said to be injurious, not only to the Scotch Pine, but also to our White Pine, when growing in Germany. P. Schweinitzii, which we consider to be a native American species, which has only comparatively recently been introduced into central Europe, is common under Pines with us, but is very seldom found growing on them, and, as far as is known here, can hardly be said to injure living trees. The lateral form mentioned by Magnus in Berlin is also found in this country, although it is quite rare, and we have never known it to occur on living trunks. Certainly our White Pines, under which the Polyporus grows, do not suffer.

The chapter on wounds is admirable, and we wish that it may be read by all persons interested in the preservation of trees. It explains most clearly how nature tries to heal wounds and why open wounds are dangerous. The practical man who has mastered the contents of this chapter will recognize many ways of applying the information there given. The last chapter gives the diseases described in the volume, classified according to the plant and part of the plant attacked, on the plan adopted in Kirchner's *Pflanzenkrankheiten*. Whether this plan has been proved practical by actual experience, we do not know. For Americans, at least, the present chapter is inapplicable, since our diseases are by no means identical with those of Europe, although, in general, similar to them.

Prickly Lettuce, Lactuca Scariola, is a native of the region about the Mediterranean Sea, and has spread as a weed over all the arable parts of Europe and Asia. It was first observed in this country thirty years ago at Cambridge, Massachusetts. Between 1878 and 1882 it made its appearance in nearly all the prominent railroad centres along the Great Lakes and the Mississippi River, and is now an abundant weed throughout a large portion of the central west, where it apparently reaches its most vigorous development. Its march has been so steady as to fill many agriculturists with alarm, and it has been spoken of in the bulletins of several experiment stations. The latest and most complete account of the weed is given in *Bulletin No. 52 of the Purdue Experiment Station.* Professor Arthur speaks of the plant as closely resembling the Cos varieties of Lettuce, and, in fact, he considers that there are grounds for believing that the garden forms of Lettuce are derived from this plant. It is an annual, but occasionally a seed germinates in autumn, and the plant will pass the winter in this form, thus becoming a winter annual as distinguished from true biennials. The height of the plant varies from a few inches in poor soil to more than six feet in rich soil. It consists generally of a central straight shaft, branched above, the lower half of which is clothed with leaves four inches to six inches long by one or two inches wide, and the upper portion of the stalk spreading into rather bare much-divided branches, which bear from July to September inconspicuous yellow flowers. Each head gives rise to a dozen dark brown fruits, consisting of a dry capsule enclosing a solitary seed with a filmy parachute like that of a Dandelion-seed, which serves to carry it long distances. One interesting character of the plant is that the leaves on the stem all assume a vertical position by turning a quarter of the way round upon the stem near the base, and they all stand on one plane, and this plane lies in the meridian, so that if a plant is looked at from the north or south the leaves present their edges only. It is thus a true compass plant, like the Rosin Weed of our prairies, Silphium laciniatum, with the exception that in the native plant the polarity is seen chiefly in the large, coarse, radical leaves, a foot or two long, while in the imported weed it is manifested in the stem-leaves.

The plant has many of the qualities which characterize the successful intruder. It has an uncompromising weedy look and wears the expression of a plant that has come to stay. It produces a great abundance of seed, more than eight thousand to a plant of ordinary size, each seed being well protected against the elements and with every facility for distribution, and it will grow and seed in any soil or surroundings. The plant is protected from herbiverous animals and boring insects by its bitter milky juice, and its prickles also have some protective value. Wherever it can maintain life seed will be formed, and if by any accident the stem is cut off, several branches will start from below and bear, perhaps, more seed than the original would have done. But it is annual after all, and when pulled up by the root the whole plant dies. Upon the whole, Professor Arthur does not consider it as dangerous as Professor Morrow and some other authorities do. It will probably be a rival of the Rag Weed, the Cockle Bur, Jimson Weed, Pig Weed and other tall-growing annuals, and will be at home along roadsides and rubbish wherever the ground is not closely covered with sod and fine foliage. Of course, it will do no good for one farmer to prevent its going to seed, so long as his neighbors will allow a million balloons, each carrying a plant, to set sail from adjacent fields. These annual weeds can be kept from cultivated grounds by tillage, and from fence-rows, roadsides and waste ground by hoeing up the roots just before they blossom each year, that is, early in July. In this way they can be kept within bounds. A suitable weed-law in every state would, of course, if it were enforced, greatly help to keep this and similar pests in subjection.

Notes.

A Washington correspondent of *The Florists' Exchange* mentions a showy yellow-flowered Cosmos which has been growing on the grounds of the Agricultural Department during the summer. It seems to be quite as floriferous as the plant now known so well, but its flowers are orange-yellow, and the divisions of the deeply cut leaves are broader. The seeds were obtained from Mexico last spring.

Since September 1st 317,763 barrels of apples have reached this market for domestic trade. King apples bring the highest prices, $3.50 a barrel being asked for the best of this sort, and Baldwins, Northern Spies and Greenings range from $2.00 to 2.50. More than 1,000,000 barrels of American apples have gone forward to Great Britain since the export season began in September. Prices in English markets two weeks ago ranged from $2.25 to $3 25 for Baldwins, $2.50 to $3.00 for Greenings and Northern Spies, and $4.50 to $7.50 for Newtown Pippins. These prices have since been lowered by the large supply, and Bald-

wins now bring but $2.00 to $2.50, while Newtown Pippins are plentiful at $2.50 to $5.62.

The death is announced, in his eighty-fouth year, of Monsieur P. Duchartre, the distinguished French botanist. He was the author of a comprehensive and lucid text-book, *Les Elementes Botanique*. He was a careful experimenter and observer and a voluminous writer in physiological botany, and in systematic botany produced, among other papers, classical monographs of the Aristolochia and Lily families. To horticulturists he is best known as editor of the *Journal of the National Horticultural Society of France*.

Florida is now sending to this city new peas, which bring $1.00 a half-peck, and string beans which cost eighty cents for the same quantity. New peppers, from the same state, are offered at fifty cents a dozen. Chicory and lettuce are coming from New Orleans, and radishes, kale and spinach from Norfolk. Field-grown tomatoes from California cost twenty-five cents a pound, and tomatoes from near-by hothouses forty to fifty cents. Mushrooms are in rather short supply and command $1.25 a pound. A few shipments of Copenhagen cabbage have been received, for which the low price of $5.00 for one hundred heads is asked.

The cranberry crop has been severely affected by the prolonged drought of last summer, damage by worms and by early frosts, so that less than 50,000 barrels constitute the output from the Cape Cod region this year, whereas 200,000 barrels were shipped last season. An extreme price last year was $5.00 a barrel, while cranberries known to the trade as defective are now quoted in the wholesale market reports at the unusual price of $6.00 to $8.00 a barrel, and prime and fancy grades range from $8.50 to $13.00. As the best berries are especially scarce, even these high prices are likely to advance later in the season.

In discussing the forage problem in the north-western prairie states, Professor Pammel says that, in addition to the various Grasses and leguminous plants, root crops, such as Turnips, Mangolds and Artichokes (Helianthus tuberosus), can be planted to advantage even in a dry season. Turnips were planted in Iowa on the 24th of June after a rainfall of two and three-tenths inches, and were cultivated once a week during forty-eight days, during which time no rain fell. The cultivation provided a constant three-inch mulch of earth, and on the 10th of August the roots averaged as large as hens' eggs. After a moderate rainfall in August the crop made a rapid growth of foliage, and many of the roots weighed five pounds each. The untrimmed crop weighed twenty-eight tons to the acre, about four tons of which were leaves, which could be utilized as green forage.

Mr. L. O. Howard, Chief of the Entomological Section of the Department of Agriculture, states that Dr. F. W. Harris was the first entomologist to receive public compensation for his labors in this country. He prepared a catalogue of insects, appended to the geological report of Massachusetts, as early as 1831, which was a work of inestimable value, when we consider the condition of American science at that time. At a later period he was appointed as one of a commission to make a geological and botanical survey of the state, and in this capacity he prepared his now classical *Report on Insects Injurious to Vegetation*, which was published in full in 1841. He reprinted the work under the name of Treatise, instead of Report, in 1842, and again in a revised form in 1852, and the whole sum received by him from the state for his labors was $175.00. In its present beautiful form, with the wood-engravings which marked an epoch in that art, this work, prepared more than half a century ago, is to-day, perhaps, above all others, the manual of working entomologists in the north-eastern section of this country. After all, it rather strains the facts to classify Dr. Harris as an "official entomologist," and the first scientific man to receive a true commission for the investigation of injurious insects was Dr. Asa Fitch, of New York, the Legislature of that state having made an appropriation in the session of 1853-54 for an examination of insects in an act which authorized the appointment of a suitable person to perform the work. Dr. Asa Fitch was appointed in May, 1854, by the New York State Agricultural Society, which body was authorized to make the selection.

From a report made by Monsieur Daubrée, Director of the French Forest Department, the area of forests managed by the Department and belonging to the state amounts to 2,691,165 acres, while that belonging to the communes and public establishments amounts to 4,738,637 acres, something more than 11,600 square miles altogether, or about one-eighteenth of the total area of France The private forests of France contain some 20,800 square miles, so that the entire forest area is fifteen and a half per cent. of the total area of the country. Of the seven and a half million acres of forest managed by the state, rather more than ten per cent. are classed as unproductive or not stocked with trees, and largely consist of waste lands which the state is acquiring constantly to prevent the denudation of the mountains by torrents or the encroachment of sand-dunes. More than half the area of the state forests are under high forest-treatment, and they consist chiefly of productive Silver Fir and Beech forests in the Vosges; forests of Pinus Laricio and Pinus Pinaster in Corsica, which yield only poor returns on account of the frequent forest fires; Beech forests in Normandy, with a small proportion of Oak, and Oak forests on the Loire, where Beech is kept subservient to the principal species. Nearly $500,000 were spent in 1892 in planting up dangerous mountain-sides and regulating the beds of mountain torrents, while $40,000 were expended in fixing shifting sands. The cost of maintaining the productive forests for that year was about $2,000,000, or less than thirty cents an acre, while the average annual yield to the acre is something less than a hundred cubic feet of wood, worth rather more than $5.00 for firewood and timber,

Farmer's Bulletin No. 21, issued by the United States Department of Agriculture, is a compact little monograph on the value and proper management of barnyard-manure. If the fertilizing constituents of the manure produced by all the farm animals of the United States are estimated at their market value the total amount foots up to the enormous sum of more than two billions of dollars in a year. This estimate does not mean that the manure produced by our farm animals is actually worth that amount of money to the farmers, for much of it is actually thrown away, and much of it is carelessly applied. It means, however, that the phosphoric acid, potash and nitrogen which this product contains would cost that much if it was purchased. It ought to be borne in mind, too, that if this valuation is too high, it takes no account of the use of manure in improving the mechanical condition and the drainage of the soil, which is almost as important as its actual fertilizing value. Professor Roberts, of Cornell University, thinks that $250.00 is a conservative estimate of the value of the manure produced during seven winter months on a small farm which carries four horses, twenty cows, fifty sheep and ten pigs. At least one-third of this is lost, which would mean for the whole country a waste of nearly $700,000,000. This little pamphlet of thirty-odd pages gives plain directions for protecting this valuable product from loss by fermentation or by the leaching out of its soluble constituents. It also explains the rational methods of preserving and applying manure, and when taken in connection with Bulletin No. 16 on Leguminous Plants for Green Manuring and Feeding, it ought to prove a real assistance to every intelligent farmer or gardener who will give it an attentive reading.

In summing up some reports on strawberries for the year, Professor Maynard, of the Massachusetts Agricultural College, speaks of Haverland as one of the best for market or home use because of the good size, color and quality of its fruit where the plants are not allowed to grow too closely. The berries are light-colored and soft in matted rows. Marshall seems to be a remarkably vigorous plant, which makes few runners, and bears large berries of perfect form, rich color and good quality. It ripens early, but shows a tendency to leaf-blight. Timbrell is pronounced of better quality than any berry thus far tested. Careful records were kept of the growth of about a hundred and twenty-five varieties, the fruit of which was picked every day and carefully weighed. There are tables which show the size, color, form, quality and firmness of the fruit, with the sex and vigor of the vines, the percentage of winter-killing in each variety, with the date of the first and last picking, all of which seems to be an expenditure of effort which an accomplished horticulturist and trained investigator could use to better purpose in some other direction. The work is of very little value after it is done, because the final test of the usefulness of any variety for any particular place must be made where it is to be planted. Much investigation is needed in the field of horticulture, where the expensive apparatus, the length of time required to conduct the experiments, and the scientific training needed to interpret them are only found at such centres as the agricultural colleges and experiment stations. This indicates the appropriate work for experts properly equipped and paid by the state. It is a waste of energy, which ought to be better employed, for scientists capable of higher work to be doing what every gardener and fruit-grower can do perfectly well for himself.